Bachelor of Computer Applications Syllabus

Session (2016-2017)

KHALSA COLLEGE
AMRITSAR
-An Autonomous College

Note:

Bachelor of Computer Applications
Semester System

Semester – I

Sr. No.	Paper No. (Code)	Subject	Marks				Page No.
			Theory	Internal Assessment	Practical	Total	
1	Paper–I	Introduction to Programming C - I	60	15	-	75	3
2	Paper–II	Introduction to Computers and Information Technology	60	15	-	75	4
3	Paper–III	Mathematical Foundation of Computer Science	60	15	-	75	-
4	Paper–IV	Communication Skills in English	40	10	-	50	-
5	Paper–V	Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)	40	10	-	50	-
6	Paper–VI	Practical–I (MS Office 2010 and Basic C Programming)	-	15	60	75	5-8

Bachelor of Computer Applications (Semester – I)

Paper–I: Introduction to Programming (C) - I

Time: 3 Hours
M. Marks: 75
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note:
1. **Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.**
2. **The student can use only Non–programmable & Non–storage type Calculator.**

UNIT-I

Logic Development and Program Development Tools: Data Representation, Flowcharts, Problem Analysis, Decision Trees/Tables, Pseudo code and Algorithms.

Fundamentals: Introduction to C, Tokens, Character set, Identifiers and Keywords, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

Operations and Expressions: Type of Operators (Arithmetic Operators, Unary Operators, Relational Operators, Logical Operators, Assignment Operators, Increment/Decrement, Bitwise Operator, & and * Operators, Conditional Operators) Precedence and Associativity of Operators, Library functions, Type conversion.

UNIT-II

Data Input and Output: Single character input, single character output, scanf and printf functions, gets and puts functions, interactive programming, getch(), getche(), getchar().

Control Statements: Preliminaries, Selection Statements: if, nested if, if–else-if ladder, switch, Iteration Statements: for loop, while, do-while, nested for. Jump Statements: return, goto, break, continue, exit().

UNIT-III

Functions: Brief overview, Defining, Accessing functions, function prototyping, passing arguments to function: Call by Value, Call by Reference, return statement, specifying argument data types, recursion.

Arrays: Defining, processing an arrays, passing arrays to a function, multi–dimensional arrays.

References:
1. Herbert Scheldt: "C, the Complete Reference"
2. Balaguruswamy: "Programming in ANSI C".
3. Scaum Outline Series: "Programming in C".
4. Dennis & Ritchie: "Programming in C".
5. Yaswant Kanetkar: "Let us C".

Bachelor of Computer Applications (Semester – I)
Paper–II: Introduction to Computers and Information Technology

Time: 3 Hours   **M. Marks: 75**
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note:
1. Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

Introduction to Computers and its Applications:

Computer definition and its characteristics , Block diagram of a computer, Evolution of Computers, Classification of Computers : Based on Generation, Based on Size (Micro, Mini, Mainframe, Super, Notebook, Personal Computer, Workstation) ,Based on Data Processing Techniques (Analog, Digital and Hybrid Computers)
Batch oriented/on line/real-time applications
Applications of Computer

UNIT-II

Interacting with the Computer:
Input Devices: Keyboard, Mouse, pens, Touch screens, Bar Code reader, Joystick, Source data automation, (MICR, OMR, OCR), Screen assisted data entry: portable / handheld terminals for data collection, vision input systems.

Output Devices: Monitor, Printers(Line, Character, Page), plotters, voice response units.

Data Storage Devices and Media: Primary storage (Storage addresses and capacity, types of memory), Secondary storage, Magnetic storage devices and Optical storage devices

UNIT-III

MS–Word 2010: Overview, creating, saving, opening, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers, book marks, symbols and dates. Using tabs and tables, header, footer and printing, mail merge, macros.

MS–Power Point 2010: Presentation overview, entering information, Presentation creation, opening and saving presentation, inserting audio and video.

References:
1. Computer Fundamentals – P.K. Sinha.
2. Introduction to Computers – N. Subramanian.
3. Introduction to Computers – Peter Norton Mcgraw Hill.
4. MS–Office _ BPB Publications.
5. Windows Based Computer Courses Gurvinder Singh & Rachhpal Singh, Kalyani Pub

Bachelor of Computer Applications (Semester –I)

Paper-VI: Practical –I

(MS Office 2010 & Basic C Programming)   M. Marks: 75
Practical Marks: 60
Practical Internal Assessment Marks: 15

Operational Knowledge of:

1. C Programming
2. Windows Based Operating System
3. MS-OFFICE 2010 (Word and PowerPoint)

Practical Assignment of C – Programming

1. Write a program to print Hello World on screen.
2. Write a program to find sum of two numbers.
3. Write a program to add , subtract, multiply, divide given numbers.
4. Write a program to calculate sum of marks in five subjects and find percentage.
5. Write a program to find area and circumference of a Circle
6. Write a program to find area and perimeter of Rectangle.
7. Write a program to find area and perimeter of a Triangle.
8. Write a program to swap two numbers using third variable.
9. Write a program to swap two numbers without using third variable.
10. Write a program to check whether a number is even or odd.
11. Write a program to find greatest among two numbers .
12. Write a program to find greatest among three numbers.
13. Write a program to find roots of Quadratic equation.
14. Write a program to print ASCII values of given range.
15. Write a program to check whether the character is vowel or not.
16. Write a program to perform arithmetic operations using switch based on integer values.
17. Write a program to find out all the numbers divisible by 5 or 7 in between 1 to 20.
18. Write a program to read marks from keyboard and your program should display equivalent grade according to the following table

Marks	Grade
80-100	Distinction
60-79	First Class
35-59	Second Class
0-34	Fail

19. Write a program to find sum of digits of a given number.
20. Write a program to check whether a number is Armstrong or not.
21. Write a program to check whether a number is Prime or not.
22. Write a program to find Factorial of given number .
23. Write a program to print Fibonacci series up to a given range.
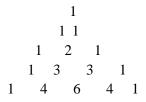24. Write a program to check whether leap year or not.

25. Write a program to compute the summation for the following series

 2+4+6+8…………………………………………+n

26. Write a program to compute the summation for the following series

 1!+2!+3!+4!....................................+n!

27. Write a program to find whether given number is Palindrome or not?

28. Write a program to print the following pattern

```
*
*   *
*   *   *
*   *   *   *


1
2  3
4  5  6
7  8  9  10
```

29. Write a program to print the following pattern

```
*  *  * *
*  *  *
*  *
*


    *                    *
   **                   *   *
  ***                    *  *  *
 ****                  *  *  *  *
```

30. Write a program to print the following Pascal Triangle

```
            1
          1  1
        1    2    1
      1    3    3    1
    1    4    6    4    1
```

31. Write a program to find sum of series $\dfrac{1}{2} - \dfrac{2}{3} + \dfrac{3}{4} + ... + \dfrac{n}{n-1}$

32. Write a program to find sum of series $\dfrac{1}{2} - \dfrac{2}{3} + \dfrac{3}{4} - \dfrac{4}{5} ...... \pm \dfrac{n}{n+1}$

33. Write a program to find conversion of Decimal number to Binary number.

34. Write a program to find conversion of Binary number to Decimal number.

35. Write a program to read an array and print it.

36. Write a program to find sum of elements of array.

37. Write a program to find transpose of a matrix.

38. Write a program to find addition of two matrices.

39. Write a program to find multiplication of two matrices.
40. Write a program to insert an element in an array at the given position.
41. Write a program to sort the array elements using Bubble sort in Ascending order.
42. Write a program to find the maximum element from given input array elements.
43. Write a program to represent a Multi-Dimensional Array in Matrix Input.
44. Write a program to find the factorial of a number using functions
45. Write a program to display an array using a function.
46. Write a program to calculate Factorial of a number using recursion.
47. Write a program to generate Fibonacci series using recursion.
48. Write a program to print sum of digits of a number using recursion.
49. Write a program to find swapping of two numbers using call by value concept.
50. Write a program to find swapping of two numbers using call by address concept.

Practical Assignment of MS Office 2010 (MS Word and MS PowerPoint)

MS-Word

1. Write down various features of Word processor which make it powerful tool.
2. Write steps to save and open files.
3. Write down function of Cut, Copy and paste.
4. Differentiate between Save and save as option.
5. Discuss various functions of standard and formatting toolbar.
6. Write down steps to add bookmark, header & footer.
7. Write steps to create table, insert text in tables and adding/removing rows/columns.
8. Write down steps to perform mail merge.
9. Write steps to record and run macros.
10. Differentiate between templates and wizards.
11. Write down use of spell checker and procedure to check grammatical error.
12. Write steps to insert/delete a character, word, line and paragraph in document
13. Write steps to insert a chart and graph in document.
14. Write procedure to import and export files.
15. Write down steps to print a document file.

MS- PowerPoint

1. Write down uses and features of PowerPoint.
2. Write different options for creating presentations.
3. Write down various ways to view a presentation
4. Write steps to resize text box and moving text area.
5. Write steps to add title, text and art..
6. Write down steps to add multimedia to presentations.
7. Write steps to choose and apply transitions to a slide.
8. Write down about zooming in and out.
9. Write steps to apply design templates.
10. Write down steps to add movies and sounds in a presentation.
11. Write procedure to insert an Excel Worksheet or Word Document.
12. Write down different formatting Options like drawing lines & curves, changing slide color scheme, setting line and fill color.
13. Write procedure to set header and footer.
14. Write procedure to import slides from other presentations.
15. Write steps to add graphics objects.

Bachelor of Computer Applications
Semester System

Semester – II

Sr. No.	Paper No. (Code)	Subject	Marks				Page No.
			Theory	Internal Assessment	Practical	Total	
1	Paper–I	Introduction to Programming C - II	60	15	-	75	10
2	Paper–II	Principles of Digital Electronics	60	15	-	75	11-12
3	Paper–III	Numerical Methods & Statistical Techniques	60	15	-	75	13
4	Paper–IV	Communication Skills in English	40	10	-	50	-
5	Paper–V	Punjabi/Basic Punjabi (Mudhli Punjabi) (Compulsory)	40	10	-	50	-
6	Paper–VI	Practical – I (Advanced C Programming)	-	15	60	75	14-17

Bachelor of Computer Applications (Semester – II)
Paper–I: Introduction to Programming (C) - II

Time: 3 Hours

Total Marks: 75
Theory Marks: 60
Theory Internal Assessment M: 15

Note:
1. Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

Strings: String declaration, string functions and string manipulation

Program Structure Storage Class: Automatic, external and static variables, multiple programs, more about library functions.

Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self referenced structure, unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one dimensional arrays, operation on pointers, pointers & multi–dimensional arrays of pointers, passing functions.

Data Files: Opening, closing, creating, and processing text and binary files, unformatted data files.

References:
1. Balaguruswamy: "Programming in ANSI C".
2. Scaum Outline Series: "Programming in C".
3. Dennis & Ritchie: "Programming in C".
4. Stephen G. Kochar: "C Programming".
5. Herbert Scheldt : "C, The Complete Reference"
6. YaswantKanetkar : "Let us C"

Bachelor of Computer Applications (Semester – II)
Paper–II: Principles of Digital Electronics

Time: 3 Hours   **Total Marks: 75**
Theory M: 60
Theory Internal Assessment M: 15

Note:
1. **Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.**
2. **The student can use only Non–programmable & Non–storage type Calculator.**

1. Number Systems.

Introduction to Decimal, Binary, Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers(Arithmetic Addition & Subtraction), Binary Codes:(BCD,Excess-3,Gray codes, ASCII), Binary Storage and Registers.

2. Boolean Algebra and Logic Gates.

Basic Definitions: Postulates and theorems of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, De-Morgan's Theorem Reducing Boolean expressions, Digital Logic Gates: (AND, OR NOT ,NAND, NOR, EX-OR, EX- NOR), Implementations using Basic Gates, Universal Gates

3. Minimization Techniques .

Canonical and Standard forms SOP and POS of Boolean functions , K-Maps simplifications up to Five-Variable Map, Sum of Product and Product of Sums Simplification, Don't-Care Conditions.

4. Combinational Logic.

Half Adder and Full Adder , Binary Adder- Subtractor, Decimal Adder, Comparator, Decoders, Encoders, Multiplexers.

5. Synchronous Sequential Logic.

Sequential Circuits, Latches, Flip-Flops(SR,JK,JK Master Slave D and T-type). Negative edge and Positive edge triggered clocks

6. Registers and Counters.

Shift Registers:(Serial-in Serial-out, Serial-in Parallel-out, Parallel-in Serial-out, Parallel-in Parallel-out), Ripple Counters, Synchronous and Asynchronous Counters, Mod counters up/down counters

7. Memory and Programmable Logic.

Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Array Logic.

References:
1. Integrated Electronics by Millman, Halkias McGraw Hill.
2. Malvino: Digital Computer Electronics, McGraw Hill.
3. D.A. Hodges & H.G. Jackson, Analysis and Design of Integrated Circuits, International, 1983.
4. Joph. F. Wakerley, Digital Principles and Practices.
5. Ujjenbeck, John: Digital Electronics: A Modern Approach, Prentice Hall, 1994.
6. Mano, M. Morris: Digital Logic and Computer Design, Edition, 1993.
7. Digital Electronics by R.K Gaur.

Bachelor of Computer Applications (Semester – II)
Paper–III: Numerical Methods & Statistical Techniques

Time: 3 Hours   **Total Marks: 75**
Theory Marks: 60
Theory Internal Assessment M: 15

Note:
1. Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.
Note for Paper Setter:
I. That the program for numerical and statistical methods are to be written in C.
II. Paper setter indicating thereby that the greater weightage is to be given to exercises rather than theoretical derivation of all numerical and statistical methods.

UNIT-I
Introduction:
1. Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.
2. Non–linear Equations, Iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bi–section, False position method, Newton Raphson – Method.
3. Simultaneous Solution of Equations, Gauss Elimination Method Gauss Jordan Method.

UNIT- II
4. Numerical Integration and differential Trapezoidal Rule, Simpson's 3/8 Rule.
5 Interpolation and Curve Fitting, Lagrangian Polynomials, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.
6 Least square fit linear trend, Non–linear trend.
$Y = ax^b$
$Y = ab^x$
$Y = ae^x$
Polynomial fit: $Y = a+bx+cx^2$
UNIT- III

Statistical Techniques:
1. Measure of Central Tendency, Mean Arithmetic, Mean geometric, Mean harmonic, Mean, Median, Mode.
2. Measures of dispersion, Mean deviation, Standard deviation, Co–efficient of variation.
3. Correlation for Bivariate data,Types of Correlation,Karl Pearson's Correlation and rank correlation.

Books Recommended:
1. V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.
2. B.S. Grewal, Numerical Methods for Engineering, Sultan Chand Publication.

Bachelor of Computer Applications (Semester – II)

Paper – VI: Practical–I (Advanced C Programming)

Total Marks: 75
Practical Marks: 60
Practical Internal Assessment M: 15

Operational Knowledge and Implementation of Numerical Methods & Statistical techniques using C language.

Practical Assignment of Numerical Methods

1. Write a program to find roots of an quadratic equation of type $ax^2+bx+c=0$.
2. Write a program to implement Bisection Method to find root of equation $x^3-4x-9=0$.
3. Write a program to implement False Position Method to find root of equation $x^3-2x-5=0$.
4. Write a program to implement Newton Raphson Method to find root of equation $x^3-4x-9=0$.
5. Write a program to find solution of system of linear equation using Gauss Elimination Method.
6. Write a program to find solution of system of linear equation using Gauss Jordan Method.
7. Write a program to implement Trapezoidal Rule for tabulated function.
8. Write a program to implement Trapezoidal Rule for known function.
9. Write a program to implement Simpson's $1/3^{rd}$ rule for tabulated function.
10. Write a program to implement Simpson's $1/3^{rd}$ rule for known function.
11. Write a program to implement Simpson's $3/8^{th}$ rule for tabulated function.
12. Write a program to implement Simpson's $3/8^{th}$ rule for known function.
13. Write a program to implement the Lagrangian Method of interpolation to interpolate value of variable 'y' for given value of variable 'x'.
14. Write a program to implement Newton's Forward Difference Interpolation Formula.
15. Write a program to implement Newton's Backward Difference Interpolation Formula.
16. Write a program to implement Newton's Divided Difference Interpolation Formula.
17. Write a program to fit the geometric curve $y=ax^b$
18. Write a program to fit the geometric curve $y=ab^x$
19. Write a program to fit the geometric curve $y=ae^{bx}$
20. Write a program to calculate Arithmetic Mean, Geometric Mean, Harmonic Mean of Individual Series
21. Write a program to calculate Arithmetic Mean, Geometric Mean, Harmonic Mean of Discrete Series.
22. Write a program to calculate Arithmetic Mean, Geometric Mean, Harmonic Mean of Continuous Series.

23. Write a program to calculate Median in the case of Individual Series.
24. Write a program to calculate Median in the case of Discrete Series.
25. Write a program to calculate Median in the case of Continuous Series.
26. Write a program to calculate Mode in the case of Discrete series.
27. Write a program to calculate Mode using empirical relation between median and mean.
    Mode= 3 Median – 2 Mean
28. Write a program to calculate Range and its Co-efficient in Continuous Series
29. Write a program to calculate Mean Deviation using Mean in the case of Individual Series.
30. Write a program to calculate Mean Deviation using Mean in the case of Discrete Series.
31. Write a program to calculate Mean Deviation using Mode in the case of Continuous Series.
32. Write a program to calculate Standard Deviation in the case of Individual Series.
33. Write a program to calculate Standard Deviation in the case of Discrete Series.
34. Write a program to calculate Standard Deviation in the case of Continuous Series.
35. Write a program to find Standard Deviation, Variance and Coefficient of Variation in the case of Continuous Series.

Advanced C Programming

1. Write a program to read string.
2. Write a program to count the length of string without using string handling function.
3. Write a program to count the total number of vowels in a string.
4. Write a program to reverse a string and also display it without using string handling function.
5. Write a program to concatenate two strings without using inbuilt functions.
6. Write a program to copy one string to another without using inbuilt function.
7. Write a program to read a string and copy the reverse of string without using inbuilt function.
8. Write a program to convert a string to uppercase.
9. Write a program to convert the string to lowercase.
10. Write a program to print length using string handling function.
11. Write a program to reverse string using string handling function.
12. Write a program to print sum of two numbers using pointers.
13. Write a program to find greatest among two numbers using pointers.
14. Write a program to swap two values using pointers using call by address.
15. Write a program to calculate factorial of numbers using pointer concept.
16. Write a program to read array using pointer.
17. Write a program to for multiplication of two matrices using pointers.
18. Write a program to swap two strings without use of third variable with help of pointers.
19. Write a program to find the sum of upper triangle & lower triangle of a matrix using pointers.
20. Write a program to read the record of a single student using structure.
21. Write a program to read and print the records of n students using structure.
22. Write a program to implement the concept of structure and union.
23. Write a program to implement the concept of all storage classes in a program.
24. Write a program to implement the concept of array of structures.
25. Write a program to implement the concept of passing structures to functions.
26. Write a program to read and print the contents of file in program.
27. Write a program to implement concept of reading single character from file.
28. Write a program to read mixed data using fscanf ().
29. Write a program for writing the block of data using fwrite ().
30. Write a program to implement the concept of reading block of data from opened file by using thefread ().
31. Write a program to implement the concept of fseek ().
32. Write a program to implement ftell (), fseek (), rewind ().
33. Write a program to implement the concept of command line argument.
34. Write a program to open a file in read, write mode.
35. Write a program to insert more data into data file using append ().
36. Write a program to write a character into file and display it.
37. Write a program to print even and odd number from file.

38. Write a program to merge two files using command line argument facility.
39. Write a program to implement malloc ().
40. Write a program to read and print the n records of a class using file handling.

Bachelor of Computer Applications
Semester System

Semester – III

Sr. No.	Paper No.	Paper	Marks				Page. No.
			Theory	Internal Assessment	Practical	Total	
1	Paper–I	Computer Architecture	60	15	-	75	19
2	Paper–II	Database Management System & Oracle	60	15	-	75	20
3	Paper–III	C++ (OOP Language)	60	15	-	75	21-22
4	Paper–IV	* Environmental Studies – I (Compulsory)	40	10	-	50	-
5	Paper–V	Programming Lab – I(Based on C++ Programming Language)	-	10	40	50	23-24
6	Paper–VI	Programming Lab – II (Oracle)	-	05	20	25	25

* Marks of Paper EVS will not be included in Grand Total.

Bachelor of Computer Applications (Semester – III)
Paper – I: Computer Architecture

Time: 3 Hours
M. Marks: 75
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note:
1. **Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.**
2. **The student can use only Non–programmable & Non–storage type Calculator.**

UNIT-I

Information Representation : Register Transfer, Various Registers, Implementing Common Bus Using Multiplexers: Logical; Arithmetic & Shift Micro – operations.

Basic Computer Design Instruction Codes, Interfacing various Registers, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

UNIT-II

CPU Design Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control, Hardwired & Microprogrammed (Wilhe's Design) Control Unit.

Memory Organization Memory Hierarchy, Designs & Concepts of Main Memory, Auxiliary Memory, Associative Memory, Cache and Virtual Memory.

UNIT-III

I/O Organization I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.

Pipeline & Vector Processing Parallel Processing Pipelining, Parallel & Distributed Computers, SISD, SIMD & MISD, MIMD Machines, Vector Processing.

References:
Computer System Architecture: M.M. Mano (PHI)
Computer Architecture: J.P. Hayes.
Computer Architecture: Patterson & Hemessy

Bachelor of Computer Applications (Semester – III)
Paper – II: Database Management System & Oracle

Time: 3 Hours   **M. Marks: 75**
                                                                   Theory Marks: 60
                                        Theory Internal Assessment Marks: 15

Note:
1. Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.
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UNIT-I

Introduction to data, field, record, file, database, database management system. Structure of database system, Advantage and disadvantage, levels of database system, Relational model, hierarchical model, network model, comparison of these models, E–R diagram, different keys used in a relational system, SQL.

UNIT-II

DBA, responsibilities of DBA, Relational form like INF, 2NF, 3NF, BCNF, 4_{th} NF, 5_{th} NF, DBTG, concurrency control and its management, protection, security, recovery of database.

UNIT-III
ORACLE 10g
SQL *PLUS : Introduction to Oracle–10g, Object Oriented Features of Oracle 10g.SQL–DDL, DML, DCL, Join methods & sub query ,Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users , Sequences, Indexing.
PL/SQL : Introduction to PL/SQL, Cursors– Implicit & Explicit, Procedures, Functions & Packages Database Triggers.

Books:
1. Introduction to Database System By C.J. Date.
2. Database Management System By B.C. Desai.
3. Database Concept by Korth.
4. Simplified Approach to DBMS– Kalyani Publishers
5. Oracle – Developer – 2000 by Ivan Bayross.
6. Database System concepts & Oracle (SQL/PLSQ) – AP Publishers

Bachelor of Computer Applications (Semester – III)
Paper – III: C++ (OOP Language)

Time: 3 Hours   **M. Marks: 75**
                                                           Theory Marks: 60
                                    Theory Internal Assessment Marks: 15

Note:
1. Eight questions are required to be set giving equal weightage to all the units. The Candidates will have to attempt any five. All questions carry equal marks.
2. The student can use only Non–programmable & Non–storage type Calculator.

UNIT-I

1. **Getting Started** :. Introduction, A brief history of C++, Variables , constants, Expression, Statements, Comments and keywords of C++, Operators in C++: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional, Precedence of Operators.Data type, Type Conversion, library function.

2. Input / Output Statements : Inputting using in and outputting using cout statements.
 Preprocessor directives, Basic program construction. A Complete C++ Program: Invoking Turbo C++, naming your program, using the editor, saving your program, compiling and linking, running the program. Errors : Compiler, linker and runtime. Other IDE Features: Compiling and linking shortcut exiting from IDE, examining files, opening an existing file,DOS shell

3. **Decision Making and Looping Statement :** If Statement, If-else statement, nesting of if statement, switch statement, conditional operator statement.
While loop, do loop, for loop, nesting of loops, break and continue statement, go to statement.

UNIT-II

4. **Arrays :** Defining an array, array type, array elements, Accessing and initializing elements of array. Programming of C++ with array. String handling, array of strings.

5. Functions : Definition of function, Declaring function, Local, global variables, execution of function. Passing argument to function. Return values Reference arguments. Overloading functions, Inline function, friend function and default parameter. Storage classes.

6. **Structures:** A simple structure, specifying the structure, defining a structure variable, Accessing Structure member, Other structure features. Structure within structure. Structure and classes. Arrays of structure.

UNIT-III

7. Object Oriented Programming Objects & Classes, Constructor & Destructor, Operator overloading: Overloading unary operators, Overloading binary operators, Data conversion, Pitfalls of operator overloading and conversion.

8. Inheritance Derived class and Base Class, Derived Class Constructors, Overriding member functions, Inheritance in the English distances class, class hierarchies, Public and Private Inheritance, Level of inheritance.

9. Polymorphism: Problems with single inheritance, Multiple inheritance, Virtual Functions, Pure Virtual Functions

Books:
1. C++ & Graphics by Vijay Mukhi's
2. Turbo C++ by Robert Lafore.
3. C++ Programming Language by Schaum's outline series

Bachelor of Computer Applications (Semester - III)
Paper – V
Programming Lab – I (Based on C++ Programming Language)

Lab – I: Based on C++ Programming Language   **M. Marks: 50**

Practical Marks: 40

Practical Internal Assessment Marks: 10

Practical Assignment of C++

1. Write a program to calculate the sum of two numbers.
2. Write a program to calculate the Simple Interest.
3. Write a program to calculate area and perimeter of a rectangle.
4. Write a program to calculate square root and cube of a given number.
5. Write a program to calculate greatest of three numbers using conditional operator.
6. Write a program to check whether a given character is vowel or not.
7. Write a program to check whether a given number is prime or not.
8. Write a program to find the sum of digits of a number.
9. Print the following pyramids:

```
1                    1                    1
2 5                  1 1                  2 3
3 6 0                1 2 1                4 5 6
4 7 9 10             1 3 3 1              7 8 9 10
                     1 4 6 4 1
```

10. Write a program to find HCF of two positive integer numbers.
11. Write a program that print n Fibonacci numbers.
12. Write a program to evaluate the series Sum $= 1+x^3+x^5+x^7+\ldots\ldots\ldots+x^{2n+1}$
13. Write a program to calculate Factorial of a number using Recursion.
14. Write a program to print the Fibonacci number using Recursion.
15. Write a program to show the use of inline function which calculates the maximum of two numbers.
16. Write a program to calculate the area of circle using inline function.
17. Write a program to show the concept of function overloading to calculate area where same name function differs in mumber of parameters.
18. Write a program to demonstrate the use of default arguments to calculate the volume of box.
19. Write a program to input and output all the elements of an array.
20. Write a program to calculate the average of 'n' numbers.
21. Write a program to search a given number from a given list of numbers entered using Linear Search.

22. Write a program to search a given number from the list of numbers entered using Binary Search.
23. Write a program to convert a decimal number to a binary number.
24. Write a program to find transpose of a matrix.
25. Write a program to calculate the product of two matrices.
26. Write a program to compare two strings using library function.
27. Write a program to check whether a given string is palindrome or not.
28. Write a program to count number of vowels , consonants, digits, spaces and other characters typed in.
29. Write a program to maintain employee information using nested structure.
30. Write a program to show the working of union.
31. Write a program to dynamically allocate and deallocate memory.
32. Write a program to generate Fibonacci numbers using objects and classes.
33. Write a program to multiply two matrices by returning an object from function.
34. Write a program to calculate average percentage of marks in a particular subject by n students of a class.
35. Write a program to demonstrate how a friend function acts as a bridge between two classes.
36. Write a program to add two complex numbers by overloading constructors.
37. Write a program to trace the flow of execution of destructor in a class.
38. Write a program to demonstrate the use of Copy Constructor.
39. Write a program to demonstrate how dynamic objects can be created and destroyed using 'new' and 'delete' operator.
40. Write a program showing the overloading of prefix and postfix increment operators.
41. Write a program to concatenate two string objects by overloading the '+' operator.
42. Write a program to convert basic to user-defined type(class).
43. Write a program to convert user-defined type(class) to basic type.
44. Write a program demonstrates Single Inheritance.
45. Write a program demonstrates Multiple Inheritance in which class is derived publicly from both the base classes.
46. Write a program demonstrates Multi-level Inheritance.
47. Write a program demonstrates Hierarchical Inheritance.
48. Write a program demonstrates Hybrid Inheritance.
49. Write a program that demonstrates the use of Virtual function.
50. Write a program that demonstrates the use of Pure Virtual function.

Bachelor of Computer Applications (Semester - III)

Paper – VI
Programming Lab-II (Oracle)

Lab – II: Practical in Oracle

M. Marks: 25
Practical Marks: 20
Practical Internal Assessment Marks: 05

Bachelor of Computer Applications
Semester System

Semester – IV

Sr. No.	Paper No.	Paper	Marks				Page No.
			Theory	Internal Assessment	Practical	Total	
1	Paper–I	Data Structure & File Processing	60	15	-	75	27
2	Paper–II	Information Technology	60	15	-	75	28
3	Paper–III	Distributing Computing	60	15	-	75	29
4	Paper–IV	System Software	60	15	-	75	30
5	Paper–V	* Environmental Studies – II (Compulsory)	40	10	-	50	-
6	Paper–VI	Lab I– (Data Structures implementation using C++)	-	10	40	50	31
7	Paper-VII	Lab II– (Distributing Computing)	-	10	40	50	32

* Marks of Paper EVS will not be included in Grand Total.

Bachelor of Computer Applications (Semester - IV)

Paper – I: Data Structures and File Processing

Time: 3 Hours   Total Marks: 75
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I
Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space trade off between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.
Searching Techniques: Linear and Binary Search.
UNIT-II
Linked Lists Types of Linked Lists, Representing Linked Lists in Memory, Advantages of using Linked Lists over Arrays, Various Operations on Linked Lists.

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quick sort Technique to sort an array.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.
Sorting Techniques: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Heap Sort.
UNIT-III
Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory, Heap Sort.

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix.

File Organization: Concept of field, record, file, blocking and compaction.

File Organization Techniques: Sequential, indexed, indexed sequential, Direct, Hashing. Concept of master and transaction files.

Text/References:
1. Data Structure – SeymourLipschutz, Schaum Outline Series.
2. File Structure & Data Structures by E. Loomis.
3. Data Structures by Trambley&Soreuson.

Bachelor of Computer Applications (Semester - IV)

Paper – II: Information Technology

Time: 3 Hours   **Total Marks: 75**
                                                                                 Theory Marks: 60
                                                            Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I

.**Information Systems**

Introduction to IT & its components, What is Information systems, Computer based information systems, Management Information System, Decision Support System, Expert System, Functional Information System, Open Information System, Transaction Processing System, System Development Process & System development Tools. Internet basics, Its uses and Applications.
Various types of information systems: Transaction processing systems, office Automation systems, MIS and decision support system.

UNIT-II

About internet and its working, business use of internet, services offered by
internet , evaluation of internet, internet service provider (ISP), windows environment for dial up networking (connecting to internet), audio on internet, Internet Addressing (DNS and IP addresses).
E–Mail Basic Introduction; Advantage and disadvantage, structure of an e–mail message, working of e–mail (sending and receiving messages), managing e–mail (creating new folder, deleting messages, forwarding messages, filtering messages) Implementation of outlook express.

UNIT-III

Internet Protocol: Introduction, file transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP.
WWW: Introduction, working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark), web designing using HTML, DHTML with programming
techniques .

Intranet and Extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

References:
1 Peter Norton, Introduction to Computers, Glencoe, Macmillan/McGraw Hill. Kroenke, Business Computer System, McGraw Hill.
2 Patric, G.Mckeown, Living with the Computers, 2nd edition, HBT Publishers, USA.
3 Hussain & Hussain, Computer Technology, Applications & Social Implications, PHI

Bachelor of Computer Applications (Semester - IV)

Paper – III: Distributed Computing

Time: 3 Hrs.

Total Marks: 75
Theory Marks: 60
Theory Internal Assessment M: 15

Note:
(i) The paper setter is required to set eight questions in all and the candidates will be required to attempt any five questions out of these eight questions. All questions will carry equal marks.
(ii) The student can use only Non-programmable & Non-storage type calculator.

UNIT I

BASIC CONCEPTS Characterization of Distributed Systems , Examples , Resource Sharing , Web Challenges , System Models –,Architectural and Fundamental Models ,Networking and Internetworking , Types of Networks , Network Principles , Internet Protocols

UNIT II

PROCESSES AND DISTRIBUTED OBJECTS Inter–process Communication ,The API for the Internet Protocols ,External Data Representation and Marshalling , Client –Server Communication , Group Communication , Distributed Objects and Remote Invocation – Communication Between Distributed Objects , Remote Procedure Call , Events and Notifications .

OPERATING SYSTEM ISSUES The OS Layer , Protection ,Processes and Threads , Communication and Invocation , OS Architecture , Security Overview ,Cryptographic Algorithms , Digital Signatures .

UNIT III

DISTRIBUTED TRANSACTION PROCESSING Transactions , Nested Transactions ,Locks , Optimistic Concurrency Control ,Timestamp Ordering , Comparison of Flat and Nested Distributed Transactions , Atomic Commit Protocols ,Concurrency Control in Distributed Transactions ,Distributed Deadlocks, Recovery.

REFERENCES 1.George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", 3rd Edition, Pearson Education, 2002.

2.Andrew S. Tanenbaum, Maartenvan Steen, Distibuted Systems, "Principles and Pardigms", Pearson Education, 2002.

Bachelor of Computer Applications (Semester - IV)

Paper – IV: SYSTEM SOFTWARE

Time: 3 Hours   **Total Marks: 75**
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT-I
Introduction to System Software
Introduction to System Software and its components
Translators, loaders, interpreters, compiler, assemblers

UNIT-II
Assemblers
Overview of assembly process, design of one pass and two assemblers
Macroprocessors
Macro definition and expansion, concatenation of macro parameters, generations of unique labels , conditional macro expansion, Recursive macro expansion

UNIT-III
Compilers
Phases of Compilation Process, Lexical Analysis, Parsing, Storage Management
Optimization
Incremental Compilers, Cross Compilers.
Loaders and Linkage editors
Basic loader functions. Relocation, program linking, linkage, editors, dynamic linking, Bootstrap
Loaders

References:
1. Leland L. Beck: System Software, An Introduction to System Programming, Addison Wesley.
2. D.M. Dhamdhere: Introduction to System Software, Tata McGraw Hill.
3. D.M. Dhamdhere: System Software and Operating System, Tata McGraw Hill, 1992.
4. Madrich, Stuarte: Operating Systems, McGraw Hill, 1974.
5. Stern Nancy Assembler Language Programming for IBM and IBM Compatible Computers, John Wiley, 1991.

Bachelor of Computer Applications (Semester - IV)

Time: 3 Hours   **Paper – VI: Lab I– (Data Structures implementation using C++)**

Total Marks: 50
Practical Marks: 40
Practical Internal Assessment Marks: 10

Lab – Data Structure implementation using C++

Practical Assignment of Data Structure Implementation using C++

Arrays

1. Write a program to Traverse an Array.
2. Write a program to Insert Item into Unsorted Array.
3. Write a program to Insert Item into Sorted Array.
4. Write a program to Delete Item from Array.
5. Write a program to Merge Two Unsorted Arrays.
6. Write a program to Merge Two Sorted Arrays.
7. Write a program to Traverse a 2-D Array.

Searching Techniques

8. Write a program to Search an Item using LINEAR SEARCH.
9. Write a program to Search an Item using BINARY SEARCH.

Sorting Techniques

10. Write a program to Sort an Array using BUBBLE SORT.
11. Write a program to Sort an Array using SELECTION SORT.
12. Write a program to Sort an Array using INSERTION SORT.
13. Write a program to Sort an Array using MERGE SORT.
14. Write a program to Sort an Array using QUICK SORT

Linked List

15. Write a program to Traverse a Linked List.
16. Write a program to Reverse a Linked List.
17. Write a program to Insert Item as First Node.
18. Write a program to Insert Item a Last Node.
19. Write a program to Insert Item After a Specific Node.
20. Write a program to Insert Item into Sorted Linked List
21. Write a program to Delete a First Node.
22. Write a program to Delete a Last Node.
23. Write a program to Delete any Specific Node.
24. Write a program to Search an Item in an Unsorted Linked List.
25. Write a program to Search an Item in a Sorted Linked List.

Stack

26. Write a program to Implement Stack using Array.
27. Write a program to Implement Stack using Linked List.

Queue

28. Write a program to Implement Queue using Array.
29. Write a program to Implement Circular Queue using Array.
30. Write a program to Implement Queue using Linked List.

Bachelor of Computer Applications (Semester - IV)

Time: 3 Hours   Paper – VII Lab II– (Distributing Computing)

Total Marks: 50
Practical Marks: 40
Practical Internal Assessment Marks: 10

Lab II – Distributing Computing (Client Server, Distributed Objects and operating system issues)

Bachelor of Computer Applications
Semester System

Semester – V

Sr. No.	Paper No.	Paper	Marks				Page No.
			Theory	Practical	Internal Assessment	Total	
1	Paper–I	Computer Networks	60	-	15	75	34
2	Paper–II	Programming in Java	60	-	15	75	35
3	Paper–III	Software Engineering	60	-	15	75	36
4	Paper–IV	Advanced Web Technologies using ASP.Net	60	-	15	75	37
5	Paper–V	Lab I – Programming in ASP.Net	-	40	10	50	38
6	Paper–VI	Lab II – Programming in Java Lab	-	40	10	50	39

Bachelor of Computer Applications (Semester – V)

Paper – I: Computer Networks

Time: 3 Hour
Total Marks: 75
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
    2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT – I

1. **Introduction:** Network Definition, Basic components of a network, network types and topologies, Uses of computer networks, network architecture.
   Transmission Media: Coaxial cable, twisted pair cable, fiber optics & satellites. OSI reference model, TCP/IP reference model, comparison of OSI and TCP reference model.

2. **Introduction to Analog and Digital Transmission:** Telephone system, Modems, Types of modems, pulse code modulation.
   Transmission & Switching: Multiplexing, circuit switching packet switching, hybrid switching, ISDN service transmission.

UNIT – II

3. **Local Area Network Protocols:** CSMA Protocols, BRAP, MLMA, IEEE standards 802, Token Bus, Token Ring, FDDI.

4. **Data Link Layer Design Issues:** Services provided to Network layer framing, error control, flow control, link management. Error detection & correction, Elementary Datalink Protocols.

5. **Design Issues of Network Layer:** Services provided to transport layer, routing, connection, internet & World Wide Web.

UNIT – III

6. **Network Security and Privacy:** Brief Introduction to Cryptography.

7. **Network Services:** File transfer, Access & Management, Electronic Mail, Remote login.

References:

1. Tannanbum, A.S.: Computer Networks, Prentice Hall, 1992, 3rd Edition.
2. Stallings, William: Local Networks: An Introduction: Macmillan Publishing Co.
3. Stallings, William: Data Computer Communication, Macmillan Publishing Co.

Bachelor of Computer Applications (Semester – V)

Paper – II: Programming in Java

Time: 3 Hours   **Total Marks: 75**
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
> 2. **The students can use only Non–Programmable & Non–Storage Type Calculators.**

Basic concepts of Java Programming and applications of Java programming.

Introduction to Java, JVM, Features of java, JDK Environment & tools like (java, javac, applet viewer, javadoc, jdb)

Object Oriented Programming Concepts: Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA.

Java Programming Fundamentals : Structure of java program , Data types ,Variables, Operators , Keywords ,Naming Convention ,Decision Making (if,switch) ,Looping(for, while),Type Casting.

Classes and Objects : Creating Classes and objects , Memory allocation for objects , Constructor ,Implementation of Inheritance (Simple , Multilevel , Hierarchical), Implementation of Polymorphism (Method Overloading , Method Overriding), Nested and Inner classes 5. Arrays String and Vector : Arrays , Creating an array , Types of Array (One Dimensional arrays , Two Dimensional array), Strings , String – Arrays ,String Methods, String Buffer class, Vectors , Wrapper classes.

Abstract Class , Interface and Packages , Modifiers and Access Control (Default, public private protected), Abstract classes and methods , Interfaces , Packages (Packages Concept , Creating user defined packages , Java Built in packages , Java.lang->math , Java.util->Random, Date, Hash Table)

Exception Handling: Exception types , Using try catch and Multiple catch , Nested try , throw , throws and finally , Creating User defined Exceptions8. File Handling : Byte Stream , character stream , file IO Basics , File Operations (Creating file , Reading ,file(Character, byte) , Writing File (Character, byte).

Applet Programming: Introduction , Types of applet , Applet Life cycle , Creating applet , Applet tag
Recommended Books
1. Programming with JAVA - E Balgurusamy
2. The Complete Reference – JAVA Herbert Schildt

Bachelor of Computer Applications (Semester – V)

Paper – III: Software Engineering

Time: 3 Hours   **Total Marks: 75**
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
   3. **The students can use only Non–Programmable & Non–Storage Type Calculators.**

UNIT – I

1. **Introduction to Software**: Definition, Software characteristics, Software components, Software Applications.
2. **Introduction to Software Engineering**: Definition, Software Engineering Paradigms, waterfall method, prototyping, interactive Enhancement, The Spiral model, Fourth Generation Technique.
3. **Software Metrics**: Role of Metrics and measurement, Metrics for software productivity and quality, Measurement software, size–oriented metrics, function oriented metrics, Metrics for software quality.

UNIT – II

4. **Software Requirement Specification (SRS)**: Problem analysis, structuring information, Data flow diagram and data dictionary, structured analysis, Characteristics and component of (SRS).
5. **Planning a Software Project**: Cost estimation, uncertainties in cost estimation, Single variable model, COCOMO model, On software size estimation, Project scheduling and milestones, Software & Personal Planning, Rayleigh curve, Personal Plan, Quality Assurance Plan, Verification & Validation (V & V), inspection & review.
6. **System Design**: Design Objectives, Design Principles, problem, Partitioning, Abstraction, Top Down and Bottom–up techniques, Structure Design, Structure Charts, Design Methodology, Design Review, Automated Cross Checking, Matrix, total number of modular, number of parameters.

UNIT – III

7. **Detailed Design**: Module specification, Specifying functional module, specifying data abstraction, PDL and Logic/Algorithim Design.
8. **Coding**: Coding by Top–down and Bottom–up, Structured Programming, Information Hiding, Programming style, Internal Documentation.
9. **Testing**: Level of testing, Test cases and test criteria, Functional Testing, Structural Testing.

References:
   1. Software Engineering, Roger S. Pressman.
   2. Integrated Approach to Software Engineering, Pankaj Jalote

Bachelor of Computer Applications (Semester – V)

Paper-IV : Advanced Web Technologies using ASP.Net

Time: 3 Hours
Total Marks: 75
Theory Marks: 60
Theory Internal Assessment Marks: 15

Standard Controls : Display information, Accepting user input, Submitting form data, Displaying images, Using the panel control, Using the hyperlink control.

Validation Controls : Using the required field validator control, Using the range validator controlusing the compare validator control, Using the regular expression validator control, Using the custom validator control, Using the validation summary controls.

Rich Controls : Accepting file uploads ,Displaying a calendar, Displaying advertisement, Displaying different page views, Displaying a wizard.

Designing Website With Master Pages : Creating master pages, Modifying master page content, Loading master page dynamically.

SQL Data Source Control: Creating database connections, Executing database commands, Using ASP.NET parameters with the SQL data source controls, Programmatically executing SQL data source commands, Cashing database data with the SQL data Source controls.

List Controls : Dropdown list control, Radio button list controls, list box controls, bulleted list controls, custom list controls.

Grid View Controls : Grid view control fundamentals, Using field with the grid view control, Working with grid view control events.

Building Data Access Components with ADO.NET: Connected the data access, Disconnected data access, Executing a synchronous database commands, Building data base objects with the .NET framework.

Reference:
ASP.NET 3.5: Stephen Walther, Pearson Education, 2005.

Bachelor of Computer Applications (Semester – V)

Time: 3 Hours   **Paper-V**   **Total Marks: 50**
Practical Marks: 40
Practical Internal Assessment Marks: 10

Lab I: Programming AND Web Development in Asp.Net

Bachelor of Computer Applications (Semester – V)

Time: 3 Hours   **Paper-VI**   **Total Marks: 50**
Practical Marks: 40
Practical Internal Assessment Marks: 10
Lab II: Programming in JAVA Lab

Practical Assignment of Programming in Java

1. Installation of J2SDK and how to compile and execute java program

2. Write a program to show Concept of Class and create an array of objects in JAVA.

3. Write a program to show Scope of Variables

4. Write a program to show Type Casting in JAVA.

5. Write a program to swap two numbers using pass by reference, pass by value .

6. Write a program to generate Fibonacci series, to find whether number is prime or not, to find even/odd number, to find factorial Using Switch.

7. Write a program to create a class Rectangle and use default and parameterized constructor to set data and calculate area.

8. Write a program to count no. of object created of a class using static variables and static methods.

9. Write a program to check if a particular string is ending with a specified word and is starting with a specified word.

10. Write a program to implement copy constructor and call constructor from another constructor.

11. Write a Program to implement Inheritance.

12. Write a program to find even values from given array and return array from method.

13. Write a program show the concept of overriding

14. Program to create thread by extending thread class

15. Program to create thread by implementing runnable interface

16. Program creating user define exception

17. Program to add two numbers using command line argument

18. A program to create a class that will at least import two packages and use the method defined in the classes of those packages

19. Write a programs to implement the use of sleep method in multi-threading.

20. Rest of the programs related to I/O Stream.

Bachelor of Computer Applications
Semester System

Semester – VI

Sr. No.	Paper No.	Paper	Marks				Page No.
			Theory	Practical	Internal Assessment	Total	
1	Paper–I	Computer Graphics	60	-	15	75	41
2	Paper–II	Operating System	60	-	15	75	42
3	Paper–III	Lab I- (Programming Lab of Computer Graphics)	-	40	10	50	43
4	Paper–IV	Project	-	160	40	200	44

Bachelor of Computer Applications (Semester – VI)

Paper – I: Computer Graphics

Time: 3 Hours   **Total Marks: 75**
                                                 Theory Marks: 60
                                 Theory Internal Assessment Marks: 15

Note 1: The paper setter is required to set eight questions in all and the candidates will be required to attempt any five. All questions carry equal marks.
   2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT – I
.
Overview of Graphics System.:Computer Graphics and their applications
Display Devices: CRT Monitors (Random – Scan and Raster Scan, DVST, Plasma – PanelDisplay, LED and LCD Monitors.
Graphics Software.

UNIT – II
Elementary Drawing: Points and various line drawing Algorithms and their comparisons. Circle generating algorithms, Algorithms for other objects like ellipses, arcs, section spirals.
Two Dimensional Transformations: Basic Transformations, Ceiling, Translation, Rotation,Reflection, Shear, Matrix representation of Basic transformations and homogenous coordinates.

UNIT – III
Composite Transformations:
Windowing and clipping. Windowing concepts, clipping and its algorithms. Window–to–view port transformations. Three Dimensional concepts. 3 D Coordinate Systems. 3 transformations. translation, scaling, rotation, projections, parallel projections. Perspective projection.
Implementation in C: C programming for drawing 2 D objects – line rectangle, arc, circle andellipse. C Programming for 2–D and 3–D transformations which include translation, rotation, scaling, reflection and shear.

References:

1. Computer Graphics by Donal Hearn M. Pardive Baker (PHI) Easter Economy Edition.

2. Computer Graphics by Roy A. Plastock and Gordon Kalley – Schaum's Series.

3. Computer Graphics by Marc Berger.

Bachelor of Computer Applications (Semester – VI)

Paper – II: Operating System

Time: 3 Hours   **Total Marks: 75**
Theory Marks: 60
Theory Internal Assessment Marks: 15

Note 1: In theory eight questions are to be set in all. The candidates are required to attempt five of them. All questions are to be of equal marks.
2. The students can use only Non–Programmable & Non–Storage Type Calculators.

UNIT – I

1. **Introduction**: Definition, Early Systems, Simple Batch system, Multi programmed Batch.Time Sharing Systems, Personal Computer System, Parallel Systems, Distributed Systems, Real–time Systems.

2. **Processes**: Process concepts, Process Scheduling, Threads.

3. **CPU–Scheduling**: Basic concepts, scheduling criteria, scheduling algorithms, algorithmevaluation.

UNIT – II

4. **Process Synchronization**: Critical – section problem, semaphores, classicalproblem of synchronization.

5. **Memory Management**: Background, Logical v/s Physical address space, swapping,continuous allocation, paging, segmentation.

6. **Virtual Memory**: Background, demand paging, performance of demand paging, pagereplacement, page replacement algorithms, allocation of frames, thrashing.

UNIT – III

7. **Secondary Storage Structures**: Disk structures, Disk scheduling, Disk Reliability.

8. **Deadlocks**: System Model, Deadlock characterization, methods for handing deadlocks,Deadlocks Prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock, combined approach to deadlock handling.

References:

1. "Operating System Concepts", Fourth Edition by Silberschatz Galvin Addison Wesley.
2. "Operating Systems: A Design Oriented Approach" by Crowley, Published by Tata McGraw Hill.
3. "Operating Systems" Second Edition by Dietel, Addison Wesley.

Bachelor of Computer Applications (Semester – VI)

Time: 3 Hours **Total Marks: 50**
Practical Marks:40
Practical Internal Assessment Marks: 10

Lab I **Paper-III**

(Programming Lab of Computer Graphics)

Practical Assignment of Computer Graphics

1. Write a program to plot a pixel with specified color.
2. Write a program to plot different pixels at different locations with specified color.
3. Write a program to draw a Vertical Line, Horizontal Line, circle, ellipse, arc, rectangle, square and sector using inbuilt function.
4. Write a program to draw intersection of two lines and a circle in between them using inbuilt function.
5. Write a program to draw a line using Slope Intercept Method.
6. Write a program to draw a line using Bresenham's algorithm.
7. Write a program to draw a line using DDA Method.
8. Write a program to draw a circle using Polynomial Method.
9. Write a program to draw a circle using Trigonometric Method.
10. Write a program to draw a circle using Bresenham's algorithm.
11. Write a program to draw a circle using mid - Point Circle Method.
12. Write a program to draw an ellipse using Polynomial Method.
13. Write a program to draw an ellipse using Trigonometric Method.
14. Write a program to draw an arc using Polynomial Method.
15. Write a program to draw an arc usingtrignometric method.
16. Write a program to draw a Sector drawing using polynomial method.
17. Write a program to draw a Sector drawing using trignometric method.
18. Write a program to translate a 2D object.
19. Write aprogram to scale a 2D object.
20. Write a program for combined 2D transformation.
21. Write a program for Shearing of a 2D object.
22. Write a program for Clipping a single point.
23. Write a program using cohen sutherland algorithm.
24. Write a program for Line clipping using midpoint subdivision algorithm.
25. Write a program to clip a polygon.
26. Write a program for a Reflection of 2D object.
27. Write a program to translate a given 3D picture.
28. Write a program to scale a given 3D object.
29. Write a program to rotate a 3D object about 3 axes.
30. Write a program to rotate a given 3D object about axis parallel to any of the 3 principle axes.
31. Write a program to rotate a given 3d object about axis not parallel to principle axes.
32. Write a program for reflection of a given 3D object.
33. Write a program for shearing of a given 3D object.

Bachelor of Computer Applications (Semester – VI)

Paper – V
PROJECT

Max. Marks: 200
Project Marks: 160
Project Internal Assessment: 40

General Instructions:

1. A software module based on the work done in the entire course is to be developed.

2. The soft copy of the module shall be submitted to the College/Institute till April 30.

3. The software module shall be developed in groups, consisting of at most two students in a group.

4. The respective college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per the University rules.

5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012–2013 under semester system.

6. Training certificate of industrial training should be submitted to the College and also attached in the project.